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ABSTRACT

Instead of being considered a curricular entity, reading should be treated as an essential part of the total learning structure through the integration of reading behaviors and academic content. The assumptions underlying the use of the skill-centered reading curriculum to meet the goal of content acquisition-that reading skills will transfer to content reading, that reading is a uniform act undifferentiated by specific task demands, and that basal reading materials stimulate the type of reading required for academic content-do not hold up under analysis. A more effective instructional approach, based upon the integration of reading and academic content, requires the determination of reading behaviors needed for reading specific content, followed by the teaching of those behaviors. Examples may be considered that show how this approach can be used in helping students develop vocabulary skills, comprehension strategies such as the drawing of inferences, and understandings of organizational patterns. Two devices that show promise for enhancing the learning of content are the structured overview and the embedded organizer. The use of an integrated reading/content approach should result in the increased acquisition of content on the part of the learner. (GW)

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Reading and Academic Content: Toward a Theory of Integration

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An examination of prevailing practices in the elementary schools substantiates the view that reading instruction is generally treated as a curricular entity, a body of skills transmitted through an instructional sequence called "reading," utilizing instructional materials such as basal readers, workbooks, skills kits, etc. The basic premise of this paper is that this curricular model of reading instruction in elementary education is inadequate to meet one of the major goals of schooling--the acquisition of academic content through the medium of the printed word. This is not to imply that reading instruction as it is commonly provided in the elementary school is either unnecessary or dispensable. Rather, it suggests a broadening of the focus of reading instruction to treat reading as an essential part of the total learning structure through the integration of reading behaviors and academic content.

The Reading Curriculum and the Academic Goals of Schooling

An analysis of schooling as it is presently constituted indicates clearly that a critical dimension of reading instruction relates to the larger issue of the acquisition of academic content. That is, the ability to read is an essential component in the

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attainment of knowledge in such curricular areas as the social sciences, the language arts, the natural and applied sciences, and mathematics. The supposition that the skills-centered reading curriculum can meet this goal of content acquisition through reading is rooted in several implicit assumptions that require examination.

The first of these concerns the process of transfer of skills. The typical reading curriculum is one which is based upon the premise that training in reading skills will be generalized to the reading of academic content through the process of transfer of training. An analysis of the literature of transfer of training may be interpreted to mean that transfer occurs under limited conditions and circumstances and that it cannot be relied upon to achieve such a broad goal as the development of reading competence in highly diverse and specialized academic content through the teaching of a generalized set of reading skills.

A closely related consideration pertains to the nature of reading itself. The expectation of transfer of reading skills is based upon a perception of reading as a uniform act, a monolith undifferentiated by the demands of the specific task to which it is to be applied. While there would appear to be evidence of general, underlying factors involved in the ability to read different academic content, it is also logically apparent that reading is an activity distinguished by the nature of the content and the purpose

for which it is being read. The following examples from typical elementary curricula offer a graphic illustration.

I never saw a moor,
I never saw the sea;
Yet know I how the heather looks
And what a wave must be.

- Emily Dickinson

During a test, car 1 traveled 10% faster than car 2. If car 2 traveled 50 miles, how far did car 1 travel?

Stretch a rubber balloon over the mouth of a bottle, making sure that it is airtight. Place the bottle in a pan of hot water. Let the bottle cool. What happens to the balloon? What does this tell you about air?

Using the globe as your reference, identify the state of the United States located between 150 and 165 degrees west longitude and between 15 and 30 degrees north latitude.

It is apparent that the reading of such diverse materials, while sharing such common behaviors as word recognition and literal comprehension, requires the adaptation of general behaviors to specific content (such as the use of interpretation for poetry

and scientific phenomena). Additionally there are specialized dimensions to different academic content, for example, the learning of technical vocabulary (latitude, longitude) and the translation of mathematical word problems into symbolic notation. A model of reading as a set of uniformly generalizable skills seems inadequate to meet such demands.

Another significant area of concern is the degree to which reading materials simulate the type of reading required in academic content. A comparison of materials developed for elementary reading instruction and content materials at corresponding grade levels reveals significant differences. Studies by Stauffer (1966) and Willmon (1975) suggest that typical basal reading materials provide a child with less than half the words necessary to deal with the technical concepts in content materials. In addition, there tends to be a marked disparity between the writing patterns of reading materials and academic content. Basal materials and the majority of children's trade books employed in individualized reading programs are typically narrative in form. However, academic content is most frequently expository, utilizing organizational structures such as logical or chronological sequence, cause-effect, comparison-contrast. As Bader (1974) states:

> There is irony in the instructional situation that provides close guidance for helping children understand a sequence of simple events in a basal reading series but

> no guidance in reading content area material written with complicated organization patterns... reading instruction based on the nature of the discipline is often neglected (p. 35).

As a consequence of the variance in vocabulary load and organizational structure, idea density or conceptual load and the numbers and types of relationships among concepts often differ substantially between reading materials and content materials. Finally, there is a notable inconsistency between the easier readability levels of reading materials with which students are trained and the more difficult levels of content materials written for the same grades. While there is some positive evidence that greater attention is being paid to reducing the reading difficulty of content materials (Johnson, 1977) as measured by readability formulae, it is significant to note that reduction of the readability level may have no impact upon the conceptual and organizational difficulty of the material as considered above.

The fundamental issue, then, is whether instructional materials, designed primarily to be vehicles for the acquisition and reinforcement of reading skills, represent adequately the complexities of academic content. The available evidence fails to support such an assumption.

Reading-Content Integration: An Alternative Model

Based upon the evidence, it becomes apparent that it is necessary to perceive reading instruction as more than the teaching of a set of skills through specially developed materials in a reading curriculum. There is further necessity to broaden instruction through an approach which addresses specifically the role of reading in academic content. This section will address the development of such a model.

Herber (1972) has developed a paradigm which portrays the possible approaches to reading instruction through the interaction of type and location of reading instruction. These are: (1) the direct teaching of general reading skills in reading class; (2) the direct teaching of content-type reading skills in reading class; (3) the direct teaching of general reading skills in content classes; (4) the functional teaching of content reading skills in content classes. Clearly, models one and two are subject to the criticisms concerning transfer and generalizability outlined in the initial section of this paper. Model three shifts the focus of instruction from reading curriculum to academic curricula, yet the skills continue to be general rather than content specific. Model four directly addresses issues of transfer and generalizability by proposing a "reading-content" integration in which reading instruction occurs within the framework of the various academic curricula and is shaped to promote the acquisition of

the details, concepts, and principles which characterize such disciplines.

An instructional approach based upon reading-content integration involves two basic components: (1) the analysis of content to determine those specific reading behaviors (vocabulary, comprehension, organizational strategies) which should be taught to facilitate its acquisition, and (2) the teaching of those behaviors as a function of content instruction. The philosophy underlying this integrated model is that the reason for teaching a skill or behavior is rooted in its usefulness for helping the student acquire knowledge from the content with which he/she is interacting.

Let us consider several examples to illustrate the process involved in reading-content integration. A primary consideration in reading academic content is mastery of the technical vocabulary underlying the presentation of concepts. Instruction must provide the learner with the ability to derive meaning for unknown technical terminology. In order to gain meaning from the following sentence, it is imperative that the reader be able to apply vocabulary skills such as context, structural analysis, and use of the dictionary.

> As the archaeologist dug deeper into the subsoil, he noticed more artifacts, such as pieces of broken pottery and simple stone tools.

In this sentence it is quite possible that the word archaeologist will require use of the dictionary, although the tenor of the

entire sentence provides some contextual clues, as might a knowledge of the structural components archaeo- and -logy. Subsoil may be defined from the context of "dug deeper," and/or from a knowledge of the prefix "sub." A series of contextual examples (broken pottery, simple stone tools) serves to provide meaning for the term artifacts.

The role of the teacher is to provide an instructional model of the application of word meaning skills through selected examples of technical terminology from the content. This is followed by directing students to other technical vocabulary in the material to which the skill(s) can be applied. The focus of such instruction is the acquisition of content through the application of word meaning skills; the vehicle of instruction is the content itself.

A critical dimension in the acquisition of content is the ability of the learner to apply comprehension strategies that will permit him/her to acquire meaning from what is read. There are many facets of comprehension which might be modeled for the student. Selected for illustration here is the process of drawing inferences by relating explicitly presented pieces of information, a behavior common to literature, the social sciences, and the natural and applied sciences.

In most parts of the world, early man used stone for his tools.. In some places he found other suitable

materials; he could use ivory where there were animals with tusks, and shells if he lived near the sea.

The selection might be portrayed graphically for the student in the following manner:

Insert Figure 1 here

The shaded area of intersection represents the level of inference, an idea to be acquired through perceiving the relationships among information given. The student might be asked to select an appropriate inference from several possible choices, such as,

___ the absence of tools hindered the development of early man

___ early man used his environment to supply his needs

___ stone was the only material used by early man to make tools

or, at a more advanced level, to generate an inference. The goal of this process is to provide the student with a model which can be manipulated and, ultimately, be internalized and applied independently to the reading of content materials.

The nature of academic disciplines is such that the written presentation of ideas tends to take certain forms and follow certain patterns. This dimension of academic content must be addressed in order to provide the reader with knowledge of the

organizational framework within which the content is presented. Expository materials develop concepts through such structures as cause-effect, comparison, superordinate and subordinate ideas, and sequence, both logical and chronological. Various literary forms such as poetry, drama and the novel are characterized by specific organizational structures.

An analysis of the following illustrative piece of material suggests that a knowledge of comparison is pertinent to an understanding of the content.

> Both birds and fish belong to the group called vertebrates, animals with backbones. However, birds are warmblooded and breathe with lungs, while fish are coldblooded and breathe with gills.

As in comprehension and word meaning, instruction should model the organizational pattern of comparison for the learner through the use of the content material, for example:

Insert Figure 2 here

Again, the purpose of such instruction is the functional teaching of organizational behaviors inherent in specific content materials for the purpose of facilitating learning.

A further aspect of organization is concerned with the imposition of certain structures upon content to facilitate

remembering. Collectively, these strategies have been classified under the heading of mathemagenic behaviors. Two such behaviors which show substantial promise for enhancing the learning of content are the structured overview and the embedded organizer.

Barron (1969) has designed a type of advance organizer which utilizes the vocabulary of the content to present to the learner a structured overview of the hierarchy of ideas and the relationships among them inherent in the material. The learner is provided with the visual representation prior to reading and relates information to the overview as it is acquired through reading. This approach has been found to have a facilitative effect upon the acquisition of content.

Carney (1973) has designed a process of using embedded organizers to promote learner interaction with content materials. The process involves the insertion of models of desirable responses to what has been read at significant points within the material. Gradually the models are withdrawn, and the learner is directed to provide appropriate responses. Experimental findings have indicated that subjects exposed to such an approach produce a significantly greater number of relevant idea units reflecting an understanding of the content than do control subjects.

The significance of the approaches to vocabulary, comprehension, and organizatien discussed above can be seen in three areas: (1) they recognize the specificity of the application of

reading behaviors to different types of content materials; (2) they facilitate the understanding of content materials typically more complex than the materials with which the learner has been taught to read; (3) they provide an instructional format which minimizes the limitations associated with generalized transfer of training by modeling reading behaviors necessary for the learning of content through the content itself.

Summary

This paper has examined the implicit assumptions underlying the prevalent curricular approach to reading instruction in the elementary schools to determine whether such an approach meets the goals of providing effective training for reading academic content. An analysis of transfer of training, the nature of reading itself, and materials of instruction suggests that the curricular model is inadequate to meet the demands of reading highly diverse academic content.

A model which alters the focus and setting of reading instruction through the integration of reading and academic content within academic curricula was considered. Examples of such integration in the areas of vocabulary, comprehension, and organizational strategies were provided. It is believed that the adoption of such an approach to reading instruction will result in the increased acquisition of content on the part of the learner through the application of reading behaviors specific to the nature of such content.

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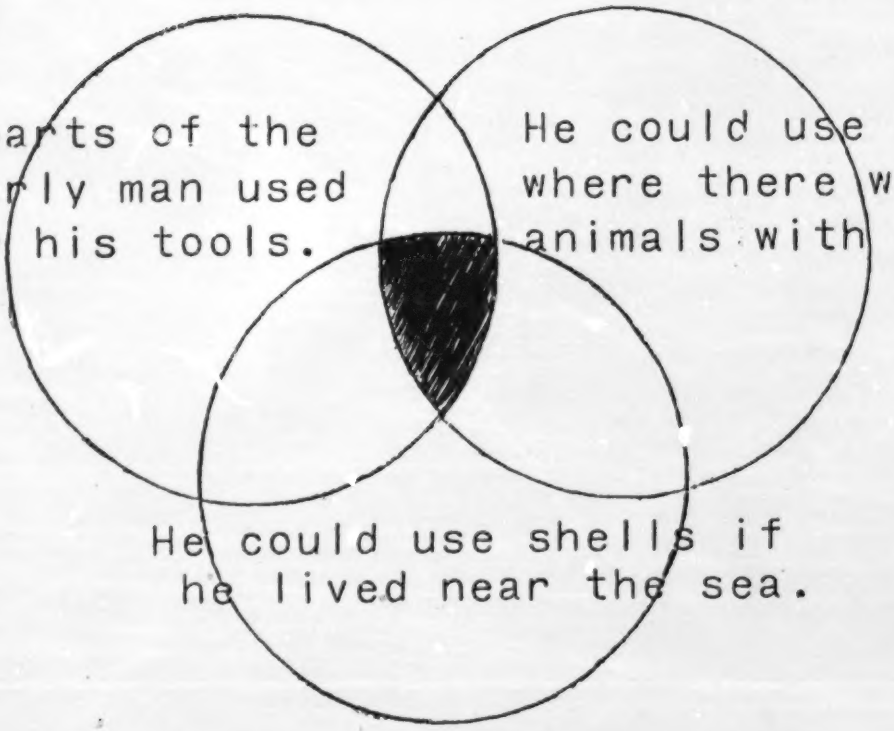
Figure Captions

Figure 1. Visual representation of inferential comprehension.

Figure 2. Visual representation of organizational pattern of comparison.


In most parts of the world, early man used stone for his tools.
He could use ivory where there were animals with tusks.
He could use shells if he lived near the sea.

	BIRDS	FISH
ALIKE	backbone	backbone
DIFFERENT	breathe with lungs	breathe with gills
DIFFERENT	warmblooded	coldblooded